

UST Closure Criteria (Draft) (April 2004, rev Sept. 2006)

Primary Criteria (Must consider):

1. **Source Removal:** Removal of leaking UST tank system.
2. **Full characterization at the site:** Sufficient number of soil borings and groundwater wells (a minimum of 3 wells) to delineate the lateral and vertical extent of the soil contamination and the lateral extent of the groundwater plume and gradient. A minimum of one continuous soil coring at a non-source area to provide lithology information and depth to groundwater at the site.
3. **Complete remedial action:** Adequate data to demonstrate the effectiveness of the soil and/or groundwater remediation. A rebound test and confirmation sampling (soil, soil gas, water) program at the previous high concentration area(s) may be necessary.
4. **Groundwater monitoring:** Groundwater sampling for a minimum of 4 consecutive quarters to monitor the variation and seasonal trend of groundwater quality and demonstrate the stability of a relatively low concentration plume. Natural attenuation parameter monitoring may be necessary.
5. **No free product:** No site closure will be granted with free product (including sheen).

Secondary Criteria (Used to support decision):

1. **Analytical data:** Evaluation of current and historical soil and groundwater analytical data, including maximum concentrations of each contaminant (the worst case scenario) and concentration spatial distribution (lateral and vertical) to estimate mass distribution and the number of "hot spots."
2. **Distance to a drinking water well**
3. **Groundwater beneficial uses**
4. **Potential future land use:** To be redeveloped or Brownfield project.
5. **Human Health Risk Assessment (HHRA):** Whenever a change in land use is proposed to include any type of residential or similar sensitive land usage, a site-specific HHRA is required. Use USEPA Region 9 Preliminary Remediation Goals (PRGs) or California Human Health Screening Levels (CHHSLs) as a start point.
6. **Available standard:** Use of the USEPA Region 9 PRGs (human health based screening levels) or RWQCB Site Assessment and Cleanup Guidebook Table 4-1 (groundwater quality based screening levels) for soil residual concentrations. Use of the maximum contaminant levels (MCLs) (human health based standard) for groundwater residual concentrations. Some other numerical screening levels may also be available.

Table 4-1: Maximum Soil Screening Levels (mg/kg) for TPH, BTEX and MTBE above Drinking Water Aquifers

T P H	Distance Above Groundwater	Carbon Range			
		C4-C12	C13-C22	C23-C32	
	>150 feet	1,000	10,000	50,000	
	20-150 feet	500	1,000	10,000	
<20 feet	100	100	1,000		

B T E X & M T B E	Distance Above Groundwater	Lithology			
		Gravel	Sand	Silt	Clay
	150 feet	B=0.044 T=2 E=8 X=23 MTBE = 0.039	B=0.077 T=4 E=17 X=48 MTBE = 0.078	B=0.165 T=9 E=34 X=93 MTBE = 0.156	B=0.8 T=43 E=170 X=465 MTBE = 0.78
	120 feet	B=0.035 T=1.57 E=6.3 X=17.9 MTBE = 0.028	B=0.058 T=3.1 E=12.7 X=36 MTBE = 0.061	B=0.123 T=7 E=25.9 X=70.3 MTBE = 0.117	B=0.603 T=32 E=128 X=351 MTBE = 0.591
	100 feet	B=0.028 T=1.3 E=5.1 X=14.4 MTBE = 0.020	B=0.046 T=2.57 E=9.86 X=28 MTBE = 0.05	B=0.094 T=5.4 E=20.4 X=55.1 MTBE = 0.091	B=0.471 T=25 E=101 X=276 MTBE = 0.464
	80 feet	B=0.022 T=1 E=4 X=11 MTBE = 0.013	B=0.033 T=2 E=7 X=20 MTBE = 0.039	B=0.066 T=4 E=15 X=40 MTBE = 0.065	B=0.34 T=18 E=73 X=200 MTBE = 0.338
	60 feet	B=0.018 T=0.72 E=2.9 X=7.9 MTBE = 0.013	B=0.026 T=1.4 E=4.9 X=13.9 MTBE = 0.03	B=0.048 T=2.8 E=10.7 X=28.4 MTBE = 0.048	B=0.241 T=13 E=52 X=141.5 MTBE = 0.247
	40 feet	B=0.015 T=0.43 E=1.8 X=4.8 MTBE = 0.013	B=0.018 T=0.87 E=2.8 X=7.8 MTBE = 0.022	B=0.029 T=1.6 E=6.3 X=16.9 MTBE = 0.03	B=0.143 T=7.5 E=30 X=83 MTBE = 0.156
20 feet	B=0.011 T=0.15 E=0.7 X=1.75 MTBE = 0.013	B=0.011 T=0.3 E=0.7 X=1.75 MTBE = 0.013	B=0.011 T=0.45 E=2 X=5.3 MTBE = 0.013	B=0.044 T=2.3 E=9 X=24.5 MTBE = 0.065	

- TPH = Total petroleum hydrocarbons.
- BTEX = benzene, toluene, ethylbenzene, and xylenes, respectively. MTBE = methyl tertiary butyl ether.
- Respective MCLs (ppm): B=0.001, T=0.15, E=0.7, X=1.75, MTBE=0.013.
- BTEX screening concentrations determined per the attenuation factor method as described in RWQCB Guidance for VOC Impacted Sites (March 1996), with a natural degradation factor of 11 for BTEX and of 3 for MTBE. Table

- values can be linearly interpolated between distance above groundwater and are proportional to fraction of each lithological thickness.
- Values in Table 4-1 are for soils above drinking water aquifers. All groundwaters are considered as drinking water resources unless exempted by one of the criteria as defined under SWRCB Resolution 88-63 (TDS>3000 mg/L, or deliverability <200 gal/day, or existing contamination that cannot be reasonably treated). Regional Board staff will make a determination of potential water use at a particular site considering water quality objectives and beneficial uses. For non-drinking water aquifers, regardless of depth, TPH for ">150 feet" category in the table should be used.
 - Distance above groundwater must be measured from the highest anticipated water level. Lithology is based on the USCS scale.
 - In areas of naturally-occurring hydrocarbons, Regional Board staff will make determinations on TPH levels.

(revised 1/7/05)